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Blastophragmia plurisetulosa gen. & sp. nov. from China

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Abstract—A new asexual ascomycete genus and species, *Blastophragmia plurisetulosa,* is described and illustrated from a specimen collected on dead branches of unidentified plants in Hainan Province, China. The fungus is distinguished by macronematous, unbranched, determinate or percurrently extending conidiophores, and solitary, acrogenous, fusiform to ellipsoidal, 3-euseptate, smooth, brown conidia with a single apical setula and 2–4 basal setulae, seceding rhexolytically from monoblastic, integrated, terminal conidiogenous cells. A key to *Blastophragmia* and its morphologically similar genera is provided.

Key words—asexual *Ascomycota*, hyphomycetes, saprobes, taxonomy

Introduction

Hainan Province is located at the southernmost extension of China. It covers approximately 35,400 km², and has a unique natural geographic environment, humid tropical monsoon climate with an average annual temperature of 22.5–25.6°C and average annual precipitation of 1500–2500 mm, which is especially favorable for various plant and microbial species.

During our continuing surveys of saprobic hyphomycetes from plant debris in the forest ecosystems of this province, an interesting fungus was collected that showed remarkable differences from all previously described hyphomycetes (Seifert & al. 2011). Thus, it is described here as a new genus and species.

Materials & methods

Samples of dead branches were collected and placed in Ziploc™ plastic bags for transport to the laboratory, where they were processed, and examined as described by Ma & al. (2011). Microphotographs were prepared using a Nikon Eclipse E200 and SmartV550Dc digital camera, with a 100 × (oil immersion) objective at the same background and scale. Adobe Photoshop 7.0 was used for image processing to assemble photographs into plates. The studied specimens are deposited in the Herbarium of Jiangxi Agricultural University, Plant Pathology, Nanchang, China (HJAUP).

Taxonomy

Blastophragmia Jian Ma, L.G. Ma, X.G. Zhang & R.F. Castañeda, **gen. nov.**

IF 557506

Differs from *Endophragmiella* by its setulate conidia; and from *Stratiphoromyces* by its conidiophores that are either determinate or with several enteroblastic percurrent extensions and its uncurved conidia.

Type species: *Blastophragmia plurisetulosa* Jian Ma & al.

Etymology: Latin, *Blasto*-, referring to the blastic conidial ontogeny, + Greek, -*phragmia*, referring to the phragmospores.

Conidiophores macronematous, mononematous, unbranched, septate, brown to dark brown, paler towards the apex, determinate or indeterminate with several enteroblastic percurrent extensions. Conidiogenous cells monoblastic, integrated, terminal, cylindrical. Conidial secession rhexolytic. Conidia solitary, acrogenous, smooth, fusiform to ellipsoidal, euseptate, setulate, usually bearing a basal frill.

Blastophragmia plurisetulosa Jian Ma, L.G. Ma, X.G. Zhang & R.F. Castañeda, **sp. nov.**

Fig. 1

IF 557507

Differs from *Endophragmiella* spp. by its setulate conidia; and from *Stratiphoromyces* spp. by its conidiophores either determinate or with several enteroblastic percurrent extensions, and its uncurved, fusiform to ellipsoidal, 3-euseptate conidia with a single apical setula and 2–4 basal setulae.

Type: China, Hainan Province: Diaoluoshan Mountain, 18°4′N 109°53′E, on dead branches of an unidentified broadleaf tree, 15 April 2015, J. Ma (**holotype**, HJAUP M0349).

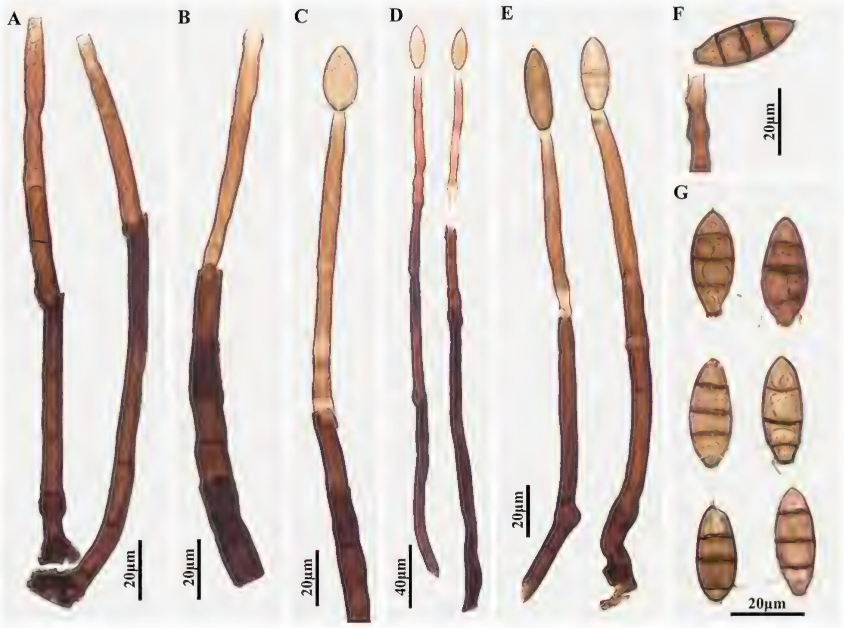

Fig. 1. *Blastophragmia plurisetulosa* (holotype, HJAUP M0349). A, B. Conidiophores showing conidiogenous cells and enteroblastic percurrent extensions, and (in B) conidiophore apex showing an initial conidium. C–E. Conidiophores and conidiogenous cells with immature conidia; F. Conidium seceding rhexolytically from conidiogenous cell; G. Conidia.

Etymology: refers to the multiple setulae, which arise from the conidial base and apex.

Colonies on the natural substrate effuse, brown to dark brown, hairy. Mycelium partly superficial, partly immersed in the substratum, composed of branched, septate, pale brown to brown, smooth-walled hyphae. Conidiophores macronematous, mononematous, unbranched, erect, straight or flexuous, cylindrical, smooth, 3–16-septate, brown to dark brown, paler towards the apex, determinate or with 1–3 enteroblastic percurrent extensions, ≤340 μm long, 6.5–13.5 μm wide. Conidiogenous cells monoblastic, integrated, terminal, cylindrical, brown to pale brown, smooth, 20–105 × 5.5–6.5 μm. Conidial secession rhexolytic. Conidia solitary, dry, acrogenous, fusiform to ellipsoidal, smooth, brown, 3-euseptate when mature, 25–32.5 × 10.5–12.5 μm; with a single apical setula and 2–4 basal setulae, thin, 5–10 μm long, straight to curved, hyaline; bearing a distinct 3.5–5 μm wide basal frill.

Discussion

Blastophragmia is distinguished by its monoblastic, integrated, terminal, cylindrical conidiogenous cells on distinct, unbranched, determinate or percurrently extending conidiophores, and solitary, acrogenous, fusiform to ellipsoidal, euseptate, conidia with a single apical setula and 2–4 basal setulae, and rhexolytic conidial secession. *Blastophragmia* appears similar in conidial ontogeny to several existing genera, including *Endophragmiella* B. Sutton (Sutton 1973), *Chaetendophragmia* Matsush. (Matsushima 1971), *Teratosperma* Syd. & P. Syd. (Sydow & Sydow 1909), and *Stratiphoromyces* Goh & K.D. Hyde (Goh & Hyde 1998). However, *Endophragmiella* differs by its asetulate conidia; *Chaetendophragmia* differs by its rostrate conidia with lateral appendages arising from the middle cells; *Teratosperma* differs by its annellidic conidiogenous cells producing conidia with lateral appendages, which arise from the basal cell; and *Stratiphoromyces* differs by its conidiogenous cells with crowded repeating percurrent extensions that lead to the apical portions of conidiophores with multilayers of wall remnants, and its conidia usually aggregating in a mass.

Several other genera, including *Arachnophora* Hennebert (Hennebert 1963), *Acrophragmis* Kiffer & Reisinger (Kiffer & Reisinger 1970), and *Phragmocephala* E.W. Mason & S. Hughes (Mason & Hughes 1951), have the same conidial secession as *Blastophragmia*, but *Arachnophora* differs by its complex conidia with a two-celled central body, from which arise several lateral, radial arms; *Acrophragmis* differs by its conidia with central cell bearing a ring of small knobs; and *Phragmocephala* differs by its asetulate conidia and cupulate or clavate conidiogenous cell.

Key to *Blastophragmia* and morphologically similar genera

1. Conidia with setulae 2
1. Conidia without setulae 3
2. Conidiogenous cells with crowded repeating percurrent extensions .... *Stratiphoromyces*
2. Conidiogenous cells determinate or with several enteroblastic percurrent extensions .... *Blastophragmia*
3. Conidia with lateral appendages 4
3. Conidia without lateral appendages 5
4. Conidial lateral appendages arising from the middle cells ...... *Chaetendophragmia*
4. Conidial lateral appendages arising from the basal cell .... *Teratosperma*

5. Conidia with central cell bearing a ring of small knobs .... *Acrophragmis*
5. Conidia with central cell not bearing small knobs 6
6. Conidia complex, with a central body bearing several lateral, radial arms
   .... *Arachnophora*
6. Conidia simple, without lateral, radial arms 7
7. Conidiogenous loci narrower than rest of conidiogenous cell,
   conidia with a regular frill around the base .... *Endophragmiella*
7. Conidiogenous loci as wide as other part of conidiogenous cells,
   conidia with an irregular frill around the base .... *Phragmocephala*

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